

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original) A coherent differential absorption lidar (DIAL) device comprising;  
  
a transmit portion for directing a combined light beam, comprising at least two component light beams of discrete wavelengths, to a remote target and providing a local oscillator beam associated with each component light beam,  
  
a receive portion for receiving light returned from the remote target and for coherently mixing the received light with its associated local oscillator beam,  
  
characterised in that the device further comprises a signal correction means, the signal correction means comprising a means for extracting a portion of each component light beam from the transmit portion, a means for introducing a frequency difference between each extracted component light beam and its associated local oscillator beam and a means for directing the extracted beam into the receive portion.
2. (original) A DIAL device according to claim 1, and further comprising a means for introducing a frequency difference between each of the at least two component light beams and the associated local oscillator beam.

3. (currently amended) A DIAL device according to ~~any preceding~~ claim 1 wherein the combined light beam is routed through a fibre optic cable prior to transmission to the remote target.

4. (currently amended) A DIAL device according to ~~any preceding~~ claim 1 wherein the transmit portion focuses light on the remote target using a first optical arrangement and the receive portion collects light from the remote target using a second, alternative, optical arrangement.

5. (currently amended) A DIAL device according to ~~any preceding~~ claim 1 wherein each of the at least two component light beams is generated by a discrete laser source.

6. (currently amended) A DIAL device according to ~~any one of claims 1-4~~ claim 1 wherein the transmit portion comprises one laser source, a means for dividing the light beam output by the laser source into at least two component light beams and a means for introducing a frequency difference between said component light beams.

7. (currently amended) A DIAL device according to ~~any preceding~~ claim 1 wherein one or more of the means for introducing a frequency difference comprises an acousto-optic modulator.

8. (currently amended) A DIAL device according to ~~any preceding~~ claim\_1 and further comprising at least one polarisation controller configured so as to control the polarisation state of the received light and/or the extracted component light beam with respect to the polarisation state of the associated local oscillator beam.

9. (currently amended) A DIAL device according to ~~any preceding~~ claim\_1 wherein the transmit portion further comprises at least one optical amplifier to amplify the intensity of one or more of the at least two component light beams.

10. (currently amended) A DIAL device according to ~~any preceding~~ claim\_1 wherein the signal correction means additionally comprises at least one delay line.

11. (currently amended) A DIAL device according to ~~any preceding~~ claim\_1 in wherein the wavelength of one of the at least two component light beams is selected to coincide with a peak in absorption of a gas species of interest.

12. (original) A method of providing a normalisation signal in a coherent DIAL device comprising the steps of;

extracting radiation from the transmit path of the device,

**BRYCE et al.**  
**U.S. National Phase of PCT/GB03/03882**

introducing a frequency difference between the extracted radiation and associated local oscillator beam, and

inputting said frequency shifted radiation into the receive path of the device.

13. (cancelled)